

Precalc Warm Up # 3-4

Solve for x

1) $2 - 5 \left| \frac{3x - 2}{5} \right| \geq -8$

2) $\frac{1 - ax}{b} - \frac{1 - bx}{a} = 0$

3) For what values of p will the inequality have no solution? $\left| \frac{3x}{2} - 7 \right| \leq 2p + 5$

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3. $\frac{x+1}{x} = \frac{(\quad)}{x(x-2)}$

In Exercises 7–20, reduce the given fraction to lowest terms.

9. $\frac{3xy}{xy+x}$

13. $\frac{x^3 + 5x^2 + 6x}{x^2 - 4}$

17. $\frac{2 - x + 2x^2 - x^3}{x - 2}$

19. $\frac{z^3 - 8}{z^2 + 2z + 4}$ App St

$$\begin{array}{r}
 17) \frac{(2-x)(1) + x^2(2-x)}{x-2} \\
 \frac{(2-x)(1+x^2)}{x-2} \\
 \frac{-1(\cancel{x-2})(1+x^2)}{(\cancel{x-2})} \\
 -1 - x^2
 \end{array}$$

$$\begin{array}{l}
 a^3 - b^3 \\
 (a-b)(a^2 + ab + b^2)
 \end{array}$$

$$\begin{array}{r}
 \frac{(z-2)(z^2 + 2z + 4)}{(z^2 + 2z + 4)} \\
 \boxed{z-2}
 \end{array}$$

23. $\frac{(x-9)(x+7)}{x+1} \cdot \frac{x}{-1(x-1)}$

$-\frac{x(x+7)}{x+1}$

27. $\frac{t^2 - t - 6}{t^2 + 6t + 9} \cdot \frac{t+3}{t^2 - 4}$

$\frac{(t+2)(t-3)}{(t+3)(t+3)} \cdot \frac{t+3}{(t+2)(t-2)}$

$\frac{t-3}{(t+3)(t-2)}$

29. $\frac{x^2 + xy - 2y^2}{x^3 + x^2y} \cdot \frac{x}{x^2 + 3xy + 2y^2}$

$\frac{(x+2y)(x-y)}{x^2(x+y)} \cdot \frac{x}{(x+2y)(x+y)}$

$\frac{(x-y)}{x(x+y)^2}$

33. $\frac{(xy)^2}{(x+y)^2} \cdot \frac{xy}{(x+y)^3}$

37. $6 - \frac{5}{x+3}$

43. $\frac{1}{x^2 - x - 2} - \frac{x}{x^2 - 5x + 6}$

LCD = $(x+1)(x-2)(x-3)$

$\frac{x-3 - x(x+1)}{(x+1)(x-2)(x-3)}$

$\frac{x-3 - x^2 - x}{(x+1)(x-2)(x-3)}$

$-\frac{x^2 + 3}{(x+1)(x-2)(x-3)}$

49. $\frac{\left(\frac{x+3}{x-3}\right)^2}{\frac{1}{(x-3)(x+3)} + \frac{1}{(x-3)(x+3)}}$

$\frac{(x+3)^2}{(x-3)^2}$

$= \frac{x-3 + x+3}{(x-3)(x+3)}$

$= \frac{(x+3)^2}{(x-3)} \cdot \frac{(x-3)(x+3)}{2x}$

$= \frac{(x+3)^3}{2x(x-3)}$

In Exercises 55–58, rationalize the denominator of the given fractional expression.

55. $\frac{3}{\sqrt{x+1}}$

In Exercises 59 and 60, rationalize the numerator of the given fractional expression.

59. $\frac{\sqrt{x+2} - \sqrt{x}}{2} \cdot \frac{\sqrt{x+2} + \sqrt{x}}{\sqrt{x+2} + \sqrt{x}}$

$$\frac{(\sqrt{x+2})^2 - (\sqrt{x})^2}{2(\sqrt{x+2} + \sqrt{x})}$$

$$\begin{aligned} (a-b)(a+b) \\ a^2 - b^2 \end{aligned}$$

$$\frac{x+2-x}{2(\sqrt{x+2} + \sqrt{x})}$$

$$\boxed{\frac{1}{\sqrt{x+2} + \sqrt{x}}}$$

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3. $\sqrt[3]{x} (3 + 4\sqrt[3]{x^2})$ 7.

$$\begin{aligned} 3\sqrt[3]{x} + 4\sqrt[3]{x}\sqrt[3]{x^2} \\ 3\sqrt[3]{x} + 4\sqrt[3]{x \cdot x^2} \\ \boxed{3\sqrt[3]{x} + 4x} \end{aligned}$$

13. $\frac{x^2 - 4}{x^4 - 2x^2 - 8} \cdot \frac{x^2 + 2}{x^2}$

$$\begin{aligned} \frac{(\cancel{x+2})(\cancel{x-2})}{(\cancel{x^2+2})(\cancel{x^2-4})} \cdot \frac{(\cancel{x^2+2})}{x^2} \\ \boxed{\frac{1}{x^2}} \end{aligned}$$

$$21. \frac{1}{x-2} + \frac{1}{(x-2)^2} + \frac{1}{x+2}$$

$$26. \frac{\left(\frac{1}{x} - \frac{1}{y}\right)}{\left(\frac{1}{x} + \frac{1}{y}\right)} \cdot \frac{xy}{xy} = \frac{y-x}{y+x}$$

31.

35.

$$37. x^4 - 2x^2 + 1 = (x+1)^2(x-1)^2$$

$$(x^2-1)(x^2-1)$$

$$(x+1)(x-1)(x+1)(x-1)$$



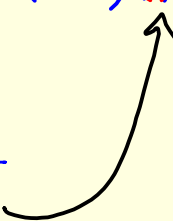
39.

42.

$$\frac{3}{4}x^2 - \frac{5}{6}x + 4 = \frac{1}{12}(?) \quad \underbrace{2x(x^2-3)^{1/3}} - \underbrace{5(x^2-3)^{4/3}} = (x^2-3)^{1/3}(?)$$

$$\frac{1}{12}(9x^2 - 10x + 48) (x^2-3)^{1/3} (2x - 5(x^2-3))$$

$$(2x - 5x^2 + 15)$$

$$\boxed{(-5x^2 + 2x + 15)}$$


Test Review: PC Ch. 1 and SL Ch. 2

Solve by clearing fractions. Don't forget to check for extraneous solutions!

$$\frac{1}{x-2} = \frac{3}{x+2} - \frac{6x}{x^2-4}$$

Test Review: PC Ch. 1 and SL Ch. 2

Solve by clearing fractions. Don't forget to check for extraneous solutions!

$$LCD = (x+2)(x-2)$$

$$(x-2)(x+2) \cdot \frac{1}{x-2} = \left(\frac{3}{x+2} - \frac{6x}{x^2-4} \right) (x-2)(x+2)$$

$$x+2 = 3(x-2) - 6x$$

$$x+2 = 3x - 6 - 6x$$

$$x+2 = -3x - 6$$

$$4x = -8$$

$$x = -2, \text{ but } x \neq -2$$

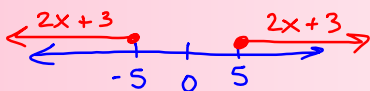
b/c right side
would be \div by 0

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More Practice

Solve:

$$|2x+3| \geq 5$$



$$2x+3 \leq -5 \text{ or } 2x+3 \geq 5$$

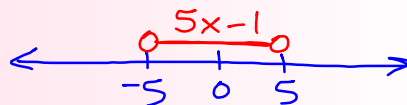
$$2x \leq -8 \quad 2x \geq 2$$

$$\boxed{x \leq -4 \text{ or } x \geq 1}$$

$$2 - |5x-1| > -3$$

$$- |5x-1| > -5$$

$$|5x-1| < 5$$



$$-5 < 5x-1 < 5$$

$$-4 < 5x < 6$$

$$\boxed{-\frac{4}{5} < x < \frac{6}{5}}$$

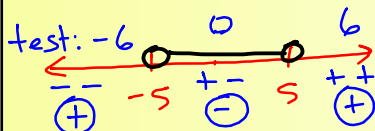
Solve:

$$x^2 - 10 < 15$$

$$-15 \quad -15$$

$$x^2 - 25 < 0$$

$$(x+5)(x-5) < 0$$



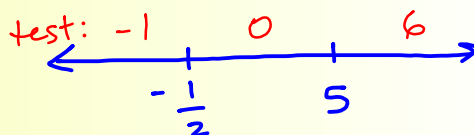
$$-5 < x < 5$$

$$2x^2 - 9x \geq 5$$

$$2x^2 - 9x - 5 \geq 0$$

$$(2x+1)(x-5) \geq 0$$

$$\text{critical \#s: } -\frac{1}{2}, 5$$



Write an equation for the parabola through

(1, -7) (-2, 11) and (3, 1)

$$ax^2 + bx + c = y \quad \textcircled{3} - \textcircled{2} \rightarrow 5a + 5b = -10$$

$$\textcircled{1} \quad a + b + c = -7$$

$$a + b = -2$$

$$\textcircled{2} \quad 4a - 2b + c = 11$$

$$\textcircled{2} - \textcircled{1} \rightarrow 3a - 3b = 18$$

$$a - b = 6$$

$$\textcircled{3} \quad 9a + 3b + c = 1$$

Solve for a & b, then plug in to get c.

$$y = 2x^2 - 4x - 5$$

Find p if the lines are to be \perp

$$px + 5y - 3 = 0 \quad \text{and} \quad 3x - y + p = 0$$

Need opposite and reciprocal slopes.

The product of the slopes = -1

Write in slope-intercept form & compare slopes!

Find the value(s) of b such that the line $y = 8x + b$ and the parabola $y = 2x^2 + 3x + 2$ has:

a. 1 intersection

$$b^2 - 4ac = 0$$

$$9 + 8b = 0$$

$$\hookrightarrow b = -\frac{9}{8}$$

b. 2 points of intersection

$$b^2 - 4ac > 0$$

$$b > -\frac{9}{8}$$

c. no intersection

$$b^2 - 4ac < 0$$

$$b < -\frac{9}{8}$$

start by combining equations

$$2x^2 + 3x + 2 = 8x + b$$

$$2x^2 - 5x + (2 - b) = 0$$

$$25 - 4(2)(2 - b)$$

$$25 - 16 + 8b$$

$$9 + 8b$$

Give the equation of a parabola with

a. x intercepts 3 and -5, and y-intercept 4

(0, 4)

$$y = a(x - p)(x - q)$$

$$4 = a(0 - 3)(0 + 5)$$

$$y = a(x - 3)(x + 5)$$

$$\frac{4}{-15} = \frac{a(-15)}{-15}$$

$$y = -\frac{4}{15}(x - 3)(x + 5)$$

b. Vertex (2, 5) and point (-1, -22)

$$y = a(x - h)^2 + k$$

$$y = a(x - 2)^2 + 5$$

$$-22 = a(-1 - 2)^2 + 5$$

$$\downarrow$$

$$a =$$

HW: Test Review worksheets